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APRIL 26, 1952

SCIENCE NEWS LETTER

TECHNOLOGY DEPT.

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APR 26 1952

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Rocket Motor Tests

See Page 263

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GENERAL SCIENCE

Atomic Energy Information

Anything in the papers is "almost certain to be misleading," Dr. Conant declares. Statements believed based on secret facts differing from newspaper accounts.

► HARVARD PRESIDENT James Conant has stated that "the general public might just as well stop reading anything in the papers about atomic energy or atomic bombs. By the nature of the case it is almost certain to be misleading."

Dr. Conant said in a lecture at New York's Columbia University that the future of atomic energy has become a matter of pride for politicians and that the public is largely informed about atomic energy by politicians only partially aware of their own distortion of the facts and unconscious of the degree of uncertainty of the facts.

Dr. Conant's statement is believed by informed sources to be the result of certain disagreements between the Harvard president and some other members of the General Advisory Committee of the Atomic Energy Commission. He is known not to have favored the attempt to build the hydrogen bomb or the recent large expansion of the whole atomic energy program.

Dr. Conant in his lecture also said: "At times half truths and necessarily ambiguous reports by responsible officials 'leak' into newspaper columns—these are the methods by which the public is informed of the progress of applied nuclear physics. I can underline what I have been saying by making one bold statement based on 12 years of experience behind the veil of secrecy: It is impossible today or in the foreseeable

future to have a frank, rational, searching discussion of the industrial uses of atomic energy."

He followed this with the statement that newspaper accounts of atomic energy are almost certain to be misleading.

Several months ago, Dr. Kenneth Pitzer, formerly connected with the Atomic Energy Commission, took Dr. Conant to task for what he considered to be Dr. Conant's unduly pessimistic statements about the prospects for use of atomic energy in industry. Also atomic scientist Dr. Harold Urey has publicly disagreed with the Harvard president's statement that the great hope for the future is solar energy, not atomic energy.

It is believed in Washington, although no one will be quoted as saying so, that Dr. Conant's statement is his way of saying to his critics: I base my position on facts which are held secret, therefore I cannot answer you publicly. Those facts are quite different from what appears in the newspapers.

The American Society of Newspaper Editors' subcommittee on atomic energy has expressed "great concern" that atomic information "leaks out" from military officials and Congressmen instead of coming from the Atomic Energy Commission. The implication, said the group, is that there is a large stockpile of hoarded information which could be released by the A.E.C. with more beneficial than harmful results.

Science News Letter, April 26, 1952

BIOPHYSICS

Radiated Blood "Chunky"

► THE FLOW of blood through the body becomes "chunky" a day or two before death from atomic radiation, Dr. Brenton R. Lutz of Boston University reported at the Federation of American Societies for Experimental Biology meeting in New York.

This finding was made in hamsters. Some of these animals got lethal doses of X-rays like the gamma rays from an atom bomb and some had hot beads planted in their cheek pouches. The beads, made of glass and about three-eighths of an inch in diameter, were hot from the beta rays given off by the radioactive strontium and yttrium incorporated into them.

With radiation strong enough to kill in eight or ten days, Dr. Lutz and associates found, the blood pressure drops a day or

two before death and the red blood cells clump into loose groups called rafts. These move along in the larger arteries but break up in the tiny capillaries which feed the blood's oxygen to the cells of the body. On the blood's return trip to the lungs to get more oxygen, the red cells clump again in the veins.

The scientists call this blood flow "chunky" and are trying to learn what it means in terms of death or chances for rescuing the victim.

Rays that are not strong enough to kill change the blood vessels and blood flow within 72 hours. The small blood vessels are twisted and puffed out and small clots float freely in the blood but may at any time clog the blood vessel. The smallest blood veinlets become increasingly fragile,

resulting in many pinpoint areas of spontaneous bleeding.

Single cells of muscles twitch. The tissue around the radioactive beads is killed and the white, dead tissue sloughs off. Blood flowing past the beta-emitting beads carries the effects to other parts of the body. This causes greater fragility of other blood vessels and the blood itself will not clot. This allows for easier infection and difficulty in stopping bleeding.

Working with Dr. Lutz on this project for the Atomic Energy Commission are Dr. George P. Fulton, Dr. David L. Jofte, Frederick W. Maynard and Miss Roma Kagan.

Science News Letter, April 26, 1952

ENGINEERING

Build Electric Circuits on Paper Before Construction

► SCIENTISTS AND engineers are building their electric circuits first on paper and then in the laboratory to get what they want without so much trial-and-error.

Known as circuit synthesis, the process is the exact opposite of circuit analysis which takes an existing circuit and determines how it acts under different conditions.

Circuit synthesis, by means of a complicated mathematical process, is used to find the proper circuit elements, their values and the way to connect them together to obtain a desired circuit which will work properly under the conditions it will have to operate.

The highly complex circuits required by modern communication equipment, radar and computing machines create many of the problems which circuit synthesis attempts to solve. Some machines may require fast-acting circuits, others may require slow-acting ones.

Circuit synthesis was discussed at a conference in New York sponsored jointly by the Polytechnic Institute of Brooklyn and the Office of Naval Research in Washington.

Science News Letter, April 26, 1952

BIOCHEMISTRY

Epilepsy Drug with Fewer Side Effects

► A NEW drug for treating epilepsy was announced by Dr. B. K. Harned of Lederle Laboratories at the meeting of the Federation of American Societies for Experimental Biology in New York.

The drug is called Hibicon chloroethylphenamide. The chemical nucleus is different from any previously used for epilepsy. It can be taken by mouth and tests with patients show that it is as effective as dilantin but side reactions, especially lack of appetite and muscular stiffness, are less.

Science News Letter, April 26, 1952

MEDICINE

Steps To Control Polio

Find polio virus is in blood stream for a few days before hitting nerves, giving hope of protection if suitable vaccinating material can be made.

► **THE DAY** when children can be protected from the paralysis and crippling of poliomyelitis seems much closer as a result of almost revolutionary findings presented to the Federation of American Societies for Experimental Biology meeting in New York.

This good news comes from the discovery, by Dr. David Bodian of Johns Hopkins University and independently by Dr. Dorothy M. Horstmann of Yale University, that the polio virus gets into the blood stream for a few days before it attacks the brain and nerves.

For a quarter of a century scientists have held that the polio virus went directly from the back of the nose and throat or from the digestive tract to the nerves. This led to a dim view of the prospects of vaccination or drug treatment or prophylaxis, because there seemed no way of getting either vaccine or drugs to the virus in the nerves.

With the virus present in the blood for even a few days, however, a chemical or a vaccine, if a suitable one can be made, can be shot right into the blood where the virus is lingering before it reaches the nerves and brain.

The virus is in the blood before paralysis or any symptoms appear. This, Dr. Bodian and Dr. Horstmann pointed out, is at least one reason why its presence there has not been detected before. It was not looked for early enough in the incubation period of the disease before the patient was sick.

Dr. Bodian and Dr. Horstmann made their findings on monkeys and chimpanzees. But the course of infection in the chimpanzee fed the polio virus is very much like that in humans during polio epidemics, Dr. Bodian stated.

It is while the virus is in the blood that the body sets up antibodies to it. If enough of these are produced, the virus is stopped before it gets to the brain and nerves, and there is no paralysis. If not enough are produced, paralysis develops.

Protecting children from paralysis during epidemic periods should be possible by giving them extra antibodies to the virus. At least two sources of such antibodies exist. One is the gamma globulin fraction of pooled blood plasma which is now used to protect against measles or modify its course. Another is the globulin fraction of placental blood from women in childbirth.

Vaccination against polio seems more promising now in view of both of these findings and of those reported by Dr. Howard

A. Howe of Johns Hopkins University. He vaccinated chimpanzees with a polio virus from monkeys after the virus had been treated with formalin to destroy its disease-producing properties. The chimps did not get paralysis when active virus was given them after the vaccination and again 19 months later.

Attempts to vaccinate children with inactivated virus, made years ago, failed. It may be that the new knowledge reported here may lead to better success in the future.

Science News Letter, April 26, 1952

MARINE BIOLOGY

Animal and Bacterial Life Found in Ocean's Depths

► **PROOF THAT** both animal and bacterial life forms exist at the greatest ocean depths has been brought back to San Francisco by the Royal Danish ship, GALATHEA, after 18 months at sea.

Probing for the first time in history that part of the ocean depths that lies between 18,000 and 34,000 feet, the ship's scientists brought to the surface eyeless fishes, hundreds of new species of marine life. Thus they succeeded in establishing definite proof that animal life exists in the deepest parts of the ocean.

The animals that managed to survive the tremendous pressures at such depths, 1,000 times that on the earth's surface, were all small, none measuring more than one inch. Their size is determined, according to Dr. Anton F. Bruun, scientific head of the expedition, by the availability of food.

Forms of animal life found at 34,000 feet included sea cucumbers or a species of marine worm, mussels, sea anemones and crustaceans.

No fish were found at depths greater than 23,000 feet. Those that were found between 18,000 and 23,000 feet were either completely eyeless or had underdeveloped, useless eyes. They were pale of color and very feeble.

Dredging ooze from the ocean floor, a sort of pale tannish color, the scientists found it contained a kind of bacteria which they were able to keep alive in the ship's laboratory under great pressures.

The bacteria seemed not to suffer when brought out in surface pressures but they did not multiply until returned to the pressures to which they were accustomed.



DEEP SEA SPECIMENS—Two unusual specimens dredged from the deep by scientists on board the GALATHEA. In the large container is a species of Typhlone, an eyeless fish taken from a depth of about three miles. The small bottle contains a new species of sea anemone, scraped from the deepest part of the ocean, 34,000 feet in the Philippine Deep.

Four American scientists have been with the expedition at various stages of its progress in the last year and a half. They are Dr. Grace Pickford of Yale University, Dr. Rolf Bolin of Stanford University, Dr. Claude ZoBell of the Scripps Institution of Oceanography, La Jolla, Calif., and Dr. Richard Morita, his assistant. The Danish scientific staff numbered eleven.

Sailing from Copenhagen in October 1950, the GALATHEA has come two-thirds of the way around the world, by a route that took her along both east and west coasts of Africa, through the Indian Ocean, in the South Pacific, and to Hawaii and continental United States. From this point, the ship expects to travel south through the Panama Canal with stops in the Caribbean and thence back to Denmark.

Science News Letter, April 26, 1952

PUBLIC SAFETY

New Stoplight Protects Motorists on Sharp Curve

► A NEW type of stoplight being used by Virginia on U. S. Highway 11 is designed to protect motorists against themselves, the American Publics Works Association reported in Chicago.

Deaths on a particular curve near Natural Bridge have reached a total of 12 during the last 10 years. Normally red, the time interval for the stoplight is designed to make motorists halt their cars if they are traveling too fast to go around the curve safely.

When a car approaches the curve, it passes over a detector in the highway which sends an impulse to the stoplight. If the motorist is driving 25 miles an hour or less, the light will turn green before the motorist has to stop. If he is traveling faster, he must stop until the light flashes the go-ahead signal.

Science News Letter, April 26, 1952

BIOCHEMISTRY

Nucleic Acid Isolated

► NUCLEIC ACID, one of the most important and mysterious substances in the body, has been isolated from the thymus glands of calves by Dr. Norman S. Simmons of the University of California at Los Angeles Medical School.

So far as is known, this is the first time that nucleic acid has been isolated in its whole, pure state.

Nucleic acid is the material that exists in the nucleus of every living cell. The genes that are found in the nucleus and thought to be responsible for the color of eyes, body size, sex, etc., are probably masses of nucleic acid combined with proteins.

Dr. Simmons and his associates in the U.C.L.A. Medical School's Atomic Energy Project revealed that basic studies on the acid have shown that the molecule is actually two to eight times larger than previously thought.

"Nucleic acid is a long, thin molecule," explained Dr. Simmons. "It is much like a string of several hundred pearls, coiled up and twisted into a solid mass, with protein molecules stuck to many of the beads."

"The task was to unravel this delicate mass without breaking the string. Such factors as high temperatures, enemy enzymes, alkalinity or acidity, or too much time spent in the process, will snap the string."

"The methods we used were refinements of old methods developed over the past 50 years. The pure acid is now being isolated under the most gentle conditions from thymus glands of calves in one day."

The scientists are now studying the material to determine correct molecular weight, size, shape and constituents with the ultimate goal of understanding its func-

tion in human growth and development and repair.

An important part of the work is its relation to cancerous body cells and body cells injured by ionizing radiation.

Science News Letter, April 26, 1952

Cheese consumption averaged 7.2 pounds per person during 1951.

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How could the moon be used as a message relay? p. 268.

DENTISTRY

Fluoridated Salt Next

Alternative to fluoridation of water seen in use of salt containing readily soluble fluorides, giving each individual a choice as to its use.

► FLUORINE-CONTAINING SALT may be developed as an alternative to fluoridation of water for the prevention of dental caries.

This possibility has been raised in research at the University of California Medical Center by Dr. Gunnar Santesson, of the Serafimer Hospital, Stockholm.

During the past year Dr. Santesson, a visiting scientist, has studied 16 groups of hamsters which have been fed on a diet with an excessively high sugar content. Some of the groups received ordinary salt in their diets, while others received salt containing readily soluble fluorides.

The groups receiving ordinary salt developed cavities as well as superficial enamel changes similar to the early stages of human dental caries. The groups receiving salt to which fluorides had been added remained free of cavities except for two minor cavities.

Dr. Santesson emphasized that his studies are preliminary, and that further studies must be made in hamsters before experiments can be made in human subjects. The scientist said that if further research demonstrates that fluorine can be effectively administered through salt certain advantages will be gained.

He expressed the opinion that the biggest advantage would be in giving the individual a free choice in the use of fluorine. A second advantage involves minority groups who drink excessive quantities of water. These people include persons with diabetes insipidus; those afflicted with psychogenic polydipsia, a compulsion to drink water; and individuals who work in hot, dry environments such as steel mills and other factories.

Dr. Santesson said that there are no known ill-effects from properly fluoridated water. However, there is not yet conclusive evidence on the effects of long-term consumption of added fluoride in excessive water drinkers.

He pointed out that it is known that the kidney of the normal adult can handle 5 milligrams of fluorine a day. In some states of disease, an individual may drink 10 liters of water a day, and if the water were fluoridated he would consume 10 milligrams of fluorine. The fluorine in excess of 5 milligrams might be stored in the body, and it is not known what effect this possible storage would have.

If fluoridated salt proves effective, it might be possible to control the fluoride intake of all individuals, including excessive water drinkers.

Fluoridated salt would also make the tooth-protecting chemical available to the rural population, constituting 35% of the population, which does not have access to community water supplies.

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PSYCHOLOGY

Muriel, Talking Monkey, Has 50-Word Vocabulary

► MURIEL, a little douroucoul monkey, can talk, Ernest P. Walker, assistant director of the National Zoological Park, told the meeting of the American Society of Mammalogists in Charleston, S. C.

In the three years that Muriel has lived in Mr. Walker's home as a member of his family, Mr. Walker has studied the sounds made by the little animal. He has made recordings of them and had them translated into light patterns on film.

This study has convinced him that certain sounds have definite significance as words. In fact he has written a douroucoul-English dictionary.



FLYING BOXCAR IMPROVED—
The new ventral fin that has been added to the U. S. Navy's R-4Q is shown in the close-up photograph. The plane is designed as a tactical and strategic military cargo aircraft for use under combat conditions.

"Wuk" means danger. A trilling sound made by blowing the lips means good. This is used of food or of people that Muriel likes. "Uh-huh?" with a rising inflection is a question. Another sound means hello, and so on.

Altogether, Muriel has a vocabulary of about 50 words, Mr. Walker said.

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BIOPHYSICS

Atomic Bombardment Changes Hemp's Sex Ratio

► YOU CAN'T argue about human sex and the atomic age from what happens to a marijuana plant, but—

The Argonne National Laboratory in Chicago has discovered that if atom-smashing particles, slow neutrons, are used to treat hemp seeds, the females are more plentiful than the males.

With uninterfered-with hemp seed, as in many other living things, humans included, the number of males is about equal to the females.

But when the *Cannabis sativa* seeds were put in Argonne's nuclear reactor for four minutes' exposure to neutrons, a research team consisting of Norbert J. Scully, George Kostal, William Chorney and Ronald Watanabe found that the sex ratio was changed to 1.75 females to each male plant. Seeds that were to produce female plants were tougher under this kind of treatment.

Male ego can be salvaged by the findings that after the next generation of intercrossed breeding, the sex ratio of hemp returns close to normal.

There are no suggested applications to marijuana (made from hemp leaves and flowers), either production or control.

Science News Letter, April 26, 1952

MEDICINE

Cigarette Smoking and Stomach Ulcers Linked

► A POSSIBLE relation between tobacco smoking and stomach ulcers appeared in a report by Drs. Kwang Soo Lee and Charles M. Gruber, Jr., of Jefferson Medical College, Philadelphia, at the meeting of the Federation of American Societies for Experimental Biology and Medicine in New York.

When dogs were given daily doses of histamine for five days, 20% of them developed ulcers. When they were given injections of nicotine in addition to the histamine, all of the dogs got ulcers. The amount of nicotine injected was equivalent to that absorbed in smoking three to five cigarettes daily.

The scientists "ventured no conclusions" as to whether smoking by humans would encourage ulcer formation.

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MEDICINE

Cancer Forecast For 1975

Figures for numbers of future victims based on population forecasts, but could be upset by discovery of ways to prevent cancer or better treatment methods.

By JANE STAFFORD

(Last of a series of five articles on what can be done about cancer)

► HERE IS the cancer forecast for the year 1975:

One million patients will be under treatment for cancer. Of these, 780,000 will be patients newly diagnosed that year. And there will be 330,000 cancer deaths during the year.

This 25-year cancer forecast comes from statisticians of the National Cancer Institute who have been making a survey of cancer in 10 representative cities. Reports on the first five cities, Atlanta, Ga., San Francisco, New Orleans, Denver and Pittsburgh, have now been completed.

The forecast for the 1975 cancer situation is based on the Census Bureau's population forecast and the National Cancer Institute's own figures for the number of cancer cases and deaths in different age groups.

Discovery of ways to prevent cancer or of better ways to treat it or both could upset this forecast. So could better application of present known methods of fighting cancer.

Here is the current cancer picture: 700,000 patients under treatment in the United States; of these, 525,000 newly diagnosed; 210,000 cancer deaths. These round number figures are estimates for one year, 1950, latest on which even estimated figures can be given.

The 1975 figures are expected to be much higher for two reasons: 1. increase in the total population of the United States; 2. increase in the proportion of older people in the nation.

These figures all include the leukemias and Hodgkin's disease.

In a typical community of 100,000 population in the United States, you could expect 350 cancer cases to be discovered each year and 140 persons to die of cancer. In this size community 450 persons each year will be under treatment for cancer.

About an equal number of men and women die of cancer each year. In 1948, latest on which accurate figures are available, the difference between male and female cancer deaths was less than 100. The 1950 estimates show about the same difference.

Although the deaths are about evenly divided between the sexes, there is a difference in the kinds of cancer attacking men and women. In men, 29% of cancer cases are cancers of the digestive organs. For

women this figure is 21%. Cancer of the respiratory system, including the lungs, accounts for 11% of cancers in men but only two and one-half percent of cancers in women. Cancer of the genital organs accounts for 11% of the cases in men but for 24% of the cases in women. In women, 21% of the cancers are cancers of the breast, but this site is rarely attacked by cancer in men. Cancer of the skin accounts for 21% of cancers in men, 14% in women.

Cancer of the digestive system is the leading form of cancer when figures for men and women are taken together. This kind of cancer accounts for 25% of all cancers. Next comes skin cancer, at 17%, although this form of cancer is not important from the standpoint of cancer deaths. The figures for all cancers in both sexes show cancer of the female genital organs at 13%, cancer of the breast 11%, cancer of the respiratory system six and one-half per cent and cancer of the male genital organs five per cent.

At the present time, one-half of cancer cases are being diagnosed while the cancer is still localized at the site of origin, the other half being diagnosed after the cancer has spread. This means that one-half the patients are having their cancers found while they are still in the most favorable condition for cure.

This picture could be very much better, however. Cancer of the lungs is diagnosed while localized in 27% of the cases, and cancer of the stomach in 21%. These figures are unfortunately low, part of the reason being that these cancers located inside the body are not easy to detect. But the breast cancer figure is even worse from the standpoint of preventing cancer deaths. Cancer of the breast is being diagnosed while still localized in 51% of the cases. This is considered far too low, considering that the breast and changes in it can be seen and felt by both the patient and the doctor without need for X-rays or other special techniques.

Some of the 330,000 persons now seen as doomed to die of cancer in the year 1975 perhaps will be saved from cancer death, maybe even from cancer itself, through research now going on in laboratories all over the country. With that hope, the American Cancer Society has since 1946 devoted \$20,500,000 of the funds contributed to it to research. During the same period the National Cancer Institute has used some \$15,500,000 of tax money for research and about \$16,300,000 for buildings to house research.

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● RADIO

Saturday, May 3, 1952, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Lewis Webster Jones, president, Rutgers University, New Brunswick, N. J., discusses "Science in the Modern University."

BIOCHEMISTRY

New Anti-Rheumatism Chemical from Switzerland

► A NEW anti-rheumatism chemical was announced by Dr. R. Domenjoz of J. R. Geigy, Ltd., Basle, Switzerland, at the meeting of the Federation of American Societies for Experimental Biology in New York.

The chemical is phenylbutazone, with the tradename Butazolidin.

When tried in human patients with rheumatism and associated disorders, it gave marked relief of pain, reduced fever and inflammation, Dr. Domenjoz reported.

In animal experiments Dr. Domenjoz found that this new drug slowed the elimination of sulfa drugs and PAS. This, he believes, may be of additional importance in its healing effect.

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ANIMAL NUTRITION

Feed Spuds to Sheep for More and Thicker Wool

► MORE WOOL from the approximately 31,000,000 sheep in the United States is foreseen if American ranchers adopt feeding practices being studied at the University of Adelaide in Adelaide, Austl.

Up to nearly one-fourth as much more wool as is now obtained can be taken from sheep fed a urea supplement and potatoes. The urea supplies nitrogen to an otherwise low-protein diet. Sheep make much better use of urea when their ration also contains adequate carbohydrate, Dr. A. W. Peirce of the University of Adelaide has found.

Not only was more wool obtained from sheep fed the urea-potato diet, but the diameter of the wool fiber from such sheep was increased about six percent.

U. S. sheep growers normally let the animals forage for themselves, but with such large increases in wool production possible, they might work out some method of supplemental feeding.

The minimum amount of starch found to be good in the pen studies was a little over three ounces per day. Dr. Peirce now proposes to find out whether this amount of starch, when fed as cereal grain, will bring about an increase in the wool production of sheep grazing on pasture which is extremely deficient in protein.

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GROWTH FACTOR CRYSTALS—A microscopic view of crystals of thioctic acid, a growth factor related to the B-complex vitamins and isolated by researchers at Lederle Laboratories, is here enlarged 50 times.

MEDICINE

Cancer Growth Rate

➤ A PERSON with a fast-growing cancer has a tendency to conceal his inner feelings and is less able to reduce tensions by "getting them off his chest" than a person with a slow-growing cancer.

This was suggested by Dr. Philip M. West of the University of California at Los Angeles Medical School in a report to the American Association for Cancer Research meeting in New York.

He and two colleagues, Dr. Eugene M. Blumberg, University of Southern California, and Dr. Frank W. Ellis, in charge of the tumor service at the Long Beach, Calif., Veterans Administration Hospital, have been engaged in what Dr. West calls "a new attack on the cancer problem."

The results of their recent research at the Long Beach VA Hospital point to the fact that at least a partial solution to cancer may be hidden in the emotional make-up of the individual.

"It seems reasonable," Dr. West said, "that the mind and body are as much a single functioning unit in cancer as in other diseases with unknown causes, such as stomach ulcers, colitis, hypertension, etc. Even such an infection as tuberculosis can be influenced by emotional stresses."

The U.C.L.A. scientist pointed out that there are often-observed but unexplainable differences of growth rate in cancer. For example: Some people with Hodgkin's dis-

ease have died within a few weeks while others have lived for more than 20 years. Also, some victims suffering from stomach cancer may live only a short period while others may live for many years.

The three-man medical-psychologist team of Drs. West, Blumberg and Ellis conducted many psychological tests among patients with fast-growing cancers as well as those with slow-growing cancers. One test, the Minnesota Multiphase Personality Inventory, showed an 88% correlation with the relative rapidity or slowness of cancer progression in an individual patient.

"Significant differences in personality were found by this test between the two groups of patients," Dr. West said. "The findings suggest that the person with a rapidly-growing tumor is less able to reduce tensions than is the person with slowly-growing tumor."

"It appears possible in many cases, therefore, to predict at the beginning of a malignant disease, long before either the patient or the doctor can have any idea of the future course, how the patient will respond to treatment, and how rapidly or slowly his tumor may grow."

Dr. West emphasized that this research is but one small facet of the huge problem of cancer and the results are still in the experimental stage.

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AERONAUTICS

Release First Photograph of Liquid Rocket Motors Tests

See Front Cover

➤ THE FIRST photograph to be released by the U. S. Air Force showing the liquid rocket motor activities of Bell Aircraft Corporation, Buffalo, N. Y., is shown on the cover of this week's SCIENCE NEWS LETTER. Two rocket motors, designed for use in guided missiles, are pictured being fired simultaneously.

Science News Letter, April 26, 1952

NUTRITION

Fat Persons Eat No More Fat Than Normals Do

➤ JACK SPRAT to the contrary, normally lean persons eat as many of their daily calories in fat as do very fat persons. Both groups choose more than the proportion generally regarded as normal for grown-ups on moderate calorie diets.

This was the case for 125 grown women, some very fat and some normal in weight, as reported by Drs. Rachel Beaudoin and Jean Mayer of Harvard School of Public Health at the meeting of the Federation of American Societies for Experimental Biology in New York.

Both groups, fat and normal, choose from 35% to 40% of their calories as fat rather than the 25% generally considered normal.

The very fat women, again contrary to what might be expected, did not eat a larger proportion of starches and sugars than the normal weight women.

Science News Letter, April 26, 1952

CHEMISTRY

Diesel Fuel Ignition Bettered by Chemical

➤ A FUEL additive which has been developed to improve ignition qualities of diesel fuel was announced in New York by B. Bynum Turner, vice-president in charge of research and engineering of the Ethyl Corporation.

Mr. Turner said as little as one-tenth of one percent by volume of the ignition improver is enough to raise the cetane number of many distillate heating oils within the range of commercial diesel fuels.

Cetane fuels, used in diesel engines, ignite more quickly than do octane fuels which are used in gasoline engines. The cetane number is an indication of the speed at which the fuel will ignite.

The fuel additive, called DB-36 amyl nitrate, will enable refiners to supply the required grades of diesel fuels in the needed quantities and at low cost, Mr. Turner speculated.

Science News Letter, April 26, 1952

GENERAL SCIENCE

Scientists and Teachers To Be Television Stars

► UNIVERSITY SCIENCE departments and high school science teachers are preparing to compete with the Jack BennyS, Eddie CantorS and Milton BerleS with their own television shows as a result of the reservation of 242 new channels for educational TV stations.

They will be able to bring into your living room the activities of tiny living cells, the workings of intricate machinery, the light from far-away stars and many other dramatic illustrations of the principles of science.

First, of course, the stations have to be built and the funds provided for such television shows. The first step in this process was the reservation, for one year, of the 242 channels by the Federal Communications Commission to educational institutions. In almost all cases, the next main step will be to persuade state and local legislative bodies to put up the funds for the transmitters, studios and programming expenses.

Education officials, such as Dr. Arthur S. Adams, president of the American Council on Education, see a vast expansion of the already broad program of extension courses now carried on by state universities. Experiments have already shown that adult students studying a course by TV do about 20% better than students taking the same course in the classroom.

With the economic and technical problems licked, chemists, physicists and other scientists hope the secrets of nature which they have already discovered will not be so mysterious to the people.

Science News Letter, April 26, 1952

BIOCHEMISTRY

Single Dose of Heart Drug Lingers in Body for Weeks

► DOCTORS NOW know for the first time much of what happens in the body to the digitoxin which for 75 years they have been prescribing for patients with heart failure. As a result, treatment may be modified in some cases.

The new knowledge comes from studies with a radioactive form of the drug, made from radioactive foxglove plants grown in the "atomic farm" of the University of Chicago. First studies of this radioactive digitoxin made on human patients were reported by George Okita, U. S. Public Health Service fellow at the university, to the Federation of American Societies for Experimental Biology meeting in New York.

The drug remains in the body much longer than previously thought, these studies show. It can be detected in the

blood as long as 24 hours after a single dose, and the drug or its breakdown products remain in the body for 40 to 74 days after a single dose. This probably accounts for the cumulative effect of the drug and suggests caution during prolonged treatment.

Most of the drug, or its breakdown products, is excreted through the kidneys instead of through the liver and digestive tract as previously thought, the studies with radioactively tagged digitoxin showed. Only 6% to 10% of the drug is excreted unchanged.

Science News Letter, April 26, 1952

MEDICINE

Tell Whether Heart Or Emotions Pain Chest

► A NEW way for doctors to determine whether a patient's chest pain is due to heart disease or to emotional disturbances was announced by Dr. Arther M. Master and associates of Mount Sinai Hospital, New York, at the meeting of the American Heart Association in Cleveland.

The method is to inject into the patient's veins a drug called dihydroergocornine and then take an electrocardiogram.

Changes in the electrocardiogram that result from anxiety states and other emotional disturbances are eliminated, but those due to actual heart disease remain on the record. Treatment can be planned accordingly.

The method has now been used in more than 300 cases and follow-up studies confirmed its validity in the majority.

Science News Letter, April 26, 1952

HORTICULTURE

Helicopter Propeller Tested Against Fruit Frost

► A BIG, 35-foot propeller, such as those used on Hiller helicopters, is being tested as a wind machine in fruit frost experiments at the University of California's Citrus Experiment station in Riverside.

Wind machines mounted on towers are used by many West Coast citrus growers to stir up the air in their orchards on frosty nights—primarily to eliminate the especially nippy, low-temperature blanket that hovers just off the ground. These machines have airplane propellers six to ten feet in diameter.

Dr. F. A. Brooks, who directs the University's experiments with wind machines, said the large propeller will move the air more slowly but farther from the tower than the conventional propellers.

"Growers are not expected to use such large propellers as this one," says Dr. Brooks, "but we shall collect through this experiment the data that will aid in determining how large a machine can be economically justified."

Science News Letter, April 26, 1952

IN SCIENCE

MEDICINE

Heparin Improves Angina Patients

► "DRAMATIC IMPROVEMENT" in 80% of a group of patients with the heart disease, angina pectoris, was achieved by twice weekly injections into the veins of the anti-clotting drug, heparin, Dr. Hyman Engelberg of Los Angeles reported at the meeting of the American Heart Association in Cleveland.

The drug was given not because of its anti-clotting action but because of its effect on the fatty protein particles found in the blood of some patients with artery hardening and on fat metabolism in the body. Heparin had previously been shown effective in preventing fatty degeneration of the arteries in rabbits.

Relief of pain in the angina patients and increased ability to tolerate exercise in patients with blood vessel disease were among the good results reported.

Science News Letter, April 26, 1952

MEDICINE

Alcohol Deaths Fewer But Alcoholism Remains Problem

► A BIG drop in deaths from chronic and acute alcoholism during the past 40 years is noted by statisticians of the Metropolitan Life Insurance Company in New York.

From a high of 6.3 deaths per 100,000 population in the period 1911-1917, the alcoholism mortality rate among the company's industrial policyholders dropped to 0.9 per 100,000 in 1950. This is only slightly above the all-time low of 0.7 recorded in 1920. Figures for the general population show a parallel trend, the statisticians state.

Although the lowest alcohol mortality rate was reached the first year the Prohibition Amendment was in effect, the statisticians point out that a number of other causes of death also recorded a marked decline during and immediately after the influenza epidemic of 1918-1919. After 1920 the rate moved upward to a peak of 4.9 in 1926 and has been falling since then.

The decline for alcoholism mortality has been greater for white persons than for the colored in the company's experience.

With about 4,000,000 people finding the use of alcohol a more or less serious problem in their lives and about 750,000 of them true alcoholics, according to estimates of the National Committee on Alcoholism, the condition is considered a serious problem in spite of the decline in mortality.

Science News Letter, April 26, 1952

SCIENCE FIELDS

SURGERY

Change in Nerve Cutting For High Blood Pressure

► SURGEONS performing a nerve cutting operation on sympathetic nerves near the spine for relief of very high blood pressure may cut more or different nerves, with better results, as a result of studies reported by Drs. W. C. Randall, A. B. Hertzman, W. F. Alexander and J. W. Cox of St. Louis University and Dr. K. E. Coldwater of the Veterans Administration Hospital, Jefferson Barracks, Mo., at the meeting of the Federation of American Societies for Experimental Biology in New York.

The object of this operation is to free certain blood vessels from nervous control so that they will be more relaxed and permit blood to flow with less pressure from and work by the heart. It has heretofore been believed that cutting the sympathetic nervous system from the first to the third lumbar vertebrae completely denervated the sweat glands and blood vessels.

The scientists found by electrical stimulation of the nerves at that level of the spine that in some patients the sweat glands would still be active, unless nerves further down on the spine were also cut. Presumably the blood vessels also would be unaffected by the operation in these patients, unless the nerve-cutting was carried out on nerves lower along the spine.

It may be possible to determine, in future operations of this type, just how extensive the nerve cutting must be if the surgeon first uses electrical stimulation and observes where sweating continues or stops.

Science News Letter, April 26, 1952

BIOCHEMISTRY

Gland Chemical Saves Premature Babies

► SALT AND an adrenal gland chemical may be the means of saving premature babies from death.

These two medicines, given every day, proved "very effective" in keeping a group of premature babies healthy, Dr. Samuel Natelson of the Rockford, Ill., Memorial Hospital reported at the meeting of the Federation of American Societies for Experimental Biology in New York.

Dr. Natelson was led to trying these substances through studies of the blood of premature babies and also of babies born at the normal time who were sick from birth for no apparent anatomical reason. The studies were made to see whether

"chemical evidence could be found for the cause of the high fatality rate in premature infants."

The babies, he found, had too little salt and too much potassium in their bodies. This was a sign their adrenal glands had not developed enough and were not functioning enough.

Dr. Natelson tried cortisone, adrenal gland chemical famous for its relief of pain and crippling arthritis. But it did not help. The adrenal gland chemical he found helped these babies is desoxycorticosterone.

The blood forming system in the babies also seemed to be damaged and they required repeated blood transfusions.

The immature state of the babies' adrenal glands did not seem to be related to the size of the babies. In the 10 babies with immature and underfunctioning adrenal glands, birth weights ranged from about two pounds to 11 pounds, while some premature babies weighing only a little over two pounds had normal adrenal gland functioning.

Science News Letter, April 26, 1952

TECHNOLOGY

Machine Coolant Cuts "Stink," Skin Irritations

► A RECENTLY developed coolant for machine shops cuts "stink," reduces machine gumming, inhibits iron and steel workpiece rusting and prevents skin irritations by using a combination of germicides and fungicides so mild they can be eaten without harm.

In describing its new coolant, the Master Chemical Corporation said those problems were solved merely by preventing bacteria from growing extensively in the coolant. Conventional germicides, which kill bacteria easily in the laboratory, were found impractical for the machine shop because they often were poisonous to the skin. Furthermore, bacteria often could develop immunity to the germicides.

Tests conducted on the coolant after it was marketed showed it had the highest lubricating qualities of any water-base coolant previously tested.

Science News Letter, April 26, 1952

MEDICINE

Danger to Athletes In Local Anesthetics

► THE AMERICAN Medical Association has condemned the indiscriminate use of local anesthetics such as procaine to keep injured amateur and professional ball players or other athletes in the game by deadening the pain of the injury.

Serious, permanent injury may result from this practice, the association warns in an editorial in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (April 19).

Science News Letter, April 26, 1952

BIOCHEMISTRY

Find Direct Evidence That Proteins Are Built by Steps

► FIRST DIRECT evidence that proteins are built in a succession of steps from simple to more complex compounds was presented by Drs. D. Steinberg and C. B. Anfinsen of the National Heart Institute, U. S. Public Health Service, at the meeting of the Federation of American Societies for Experimental Biology in New York.

Proteins are the chemicals which make up substances ranging from the meat and eggs we eat to our blood, brains and muscles. They are built from chemicals called amino acids, often referred to as the building blocks of protein.

Heretofore scientists have thought a protein molecule was made on a built-in master template, like a mold, and that all the free amino acids needed for a particular protein were stamped into the mold in one simultaneous reaction.

The stepwise reaction was discovered in a study of ovalbumin, the protein in egg white. By adding radioactive amino groups to the synthesis reaction and later checking split segments of the finished protein molecule with a Geiger counter, the scientists showed the reaction was stepwise.

Further studies of the intermediate compounds, it was suggested, might give medical science new knowledge for eventually controlling the vital giant complexes that include such substances as insulin, ACTH, blood proteins and growth hormone.

Science News Letter, April 26, 1952

PUBLIC SAFETY

Most Home Injuries In Kitchen and Yard

► THE HOME is a dangerous place, with the kitchen the place where most women receive injuries and the yard the location of the highest injury rate among men.

A survey by the University of Michigan School of Public Health, Ann Arbor, of a typical area of this state shows that women average eight home accidents annually compared with four for men. But, say the experts, put the aprons on the men and they would probably have as many accidents.

Minor accidents were 50 times more frequent than major ones that cause loss of time, expense or outside medical aid. Some people were found who had more than one superficial injury a week or more than one major injury per year.

The living room was found to be the place of the third highest accident toll of both sexes.

This interviewing of more than 8,000 people is designed to discover ways to reduce home accidents, among which were fatal injuries totalling annually 27,500 for the nation.

Science News Letter, April 26, 1952

ASTRONOMY

Mars Closest Since 1943

During May the red planet shines brightly in the constellation of Virgo, the virgin. Distance of Mars at opposition this year will be 51,860,000 miles.

By JAMES STOKLEY

► **COMING CLOSER** on May 8 than it has since December, 1943, the red planet Mars now shines brilliantly in the southern evening sky. On that date its distance will be 51,860,000 miles.

By the astronomer's scale of brightness it is now of magnitude minus 1.5, which means that it is about ten times as bright as a typical first magnitude star.

The position of Mars in the evening sky is depicted on the accompanying maps, which show the appearance of the skies at about 10:00 p.m., May 1, an hour earlier at the middle of the month and two hours earlier at the end. (Add one hour if you are on daylight time.)

Mars stands in the constellation of Virgo, the virgin, a little to the left of the bright star Spica. To the right of this star is our other visible evening planet, Saturn, a little brighter than Spica, though considerably fainter than Mars.

To the right of Virgo is Leo, the lion, with Regulus, another star of the first magnitude. It stands at the end of the handle of the sickle, a sub-group within the constellation. And directly above the left-hand end of Virgo is the figure of Bootes, the bear-driver, with bright Arcturus.

Toward the west, a few of the bright stars of the winter evening are making their last stand. Low in the northwest is Capella, in Auriga, the charioteer, and next to the left are the twins, Gemini, with first-magnitude Pollux. Still farther left we find Canis Minor, the lesser dog, with Procyon.

To the northeast, in a position whence it will climb higher into better view during the evenings of the coming months, is Vega, in Lyra, the Lyre. Just below Vega is Cygnus, the swan, with Deneb.

This star is also of the first magnitude, though the fact that it is so near the horizon dims it considerably. The same thing is true of Antares, in Scorpius, the scorpion, which is just peeping over the southeastern horizon.

In addition to Mars and Saturn, the only other naked-eye planet visible during these May nights is Jupiter. Of magnitude minus 1.6, it is slightly brighter than Mars. It rises, in the constellation of Aries, the ram, about an hour before the sun.

Venus is too close to the sun to be seen at present. Mercury, on May 3, is farthest

to the west of the sun, so that it comes up before sunrise. Even at best it is so low that it will be difficult to locate.

Once in about two years and two months, Mars comes near the earth, as it reaches the opposite direction from the sun. However, the distance at such an opposition varies considerably from a maximum of about 63,000,000 miles, to less than 35,000,000 at minimum.

Favorable Oppositions Periodical

At intervals of either 15 or 17 years there is a favorable opposition, followed by a series of less favorable ones until the maximum is reached, after which they start improving. At present we are on this side of the cycle, the maximum having been reached in February, 1948.

At the opposition of March, 1950, the two planets were 60,700,000 miles apart, and now, with 51,860,000 miles, we have almost reached the average opposition distance of 48,600,000 miles.

In June, 1954, this will be reduced to 40,300,000 miles. Then in September, 1956, comes a very favorable one. At that time Mars will be only 35,400,000 miles away, almost as close as in August, 1924, when it came closer than it will again for several centuries.

In 1956 new instruments and observing techniques will doubtless enable astronomers to go far toward solution of some of the problems of Mars. Even this year, though we have only an average close approach, many astronomers are paying more than the usual attention to this ruddy planet.

The most widely discussed features of

Mars are the curious markings discovered in 1877 by the Italian astronomer Schiaparelli. To him they appeared as long straight lines, and he called them "canali," an Italian word that simply means "channels." But since it sounds like the English word "canals" that is what they have generally been called in English-speaking countries, a rather unfortunate thing because "canal" implies an artificial structure.

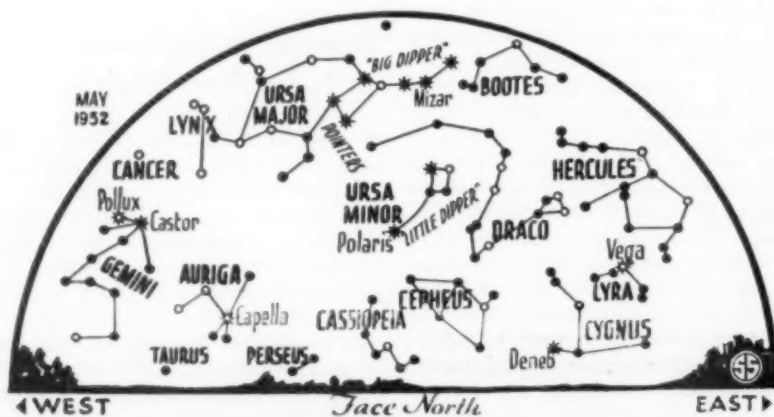
Percival Lowell, who founded the Observatory at Flagstaff, Ariz., principally for the study of Mars and other planets, thought the "channels" were actual canals, built by intelligent beings to conserve a dwindling water supply. This idea, however, has not been widely accepted.

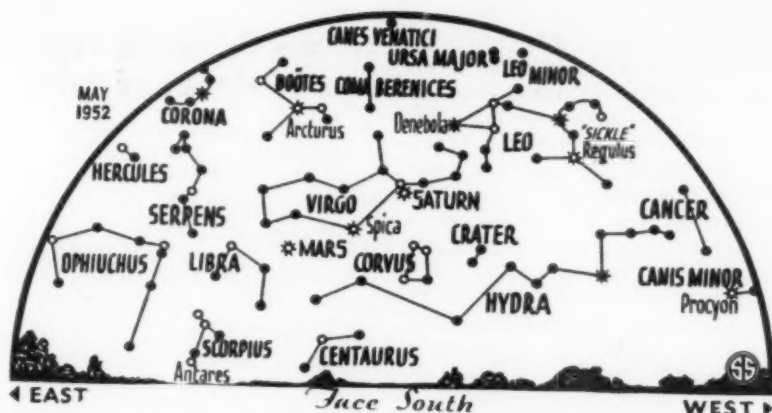
Indeed there are some astronomers who even deny the existence of the canals. They have called them, in effect, an optical illusion, stating that the eye tends to connect scattered irregular spots with narrow lines. Others, however, vigorously refute these suggestions, and point out that while some of the observed lines do go from one larger dark spot to another, in a number of cases they just "dangle" and have no dark spot at the ends.

Question of Life on Mars

The possibility of life on Mars is likewise a perennial subject for discussion. Since there is no appreciable oxygen in the atmosphere of Mars, and apparently very little water vapor, higher forms of life as we know it could hardly exist.

This, however, may not bar some primitive form of vegetation, such as the terrestrial lichen. These grow on earth under the most rigorous conditions, where no other plant life is possible. They are found in the Himalayas as high as 15,000 feet. They can even grow on bare rock, because they produce acids that decompose the rock.





• • • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Actually the lichen consists of two separate plants, living together so closely that the unit even reproduces itself. One plant is a fungus and the other is an alga, closely related to the green scum that sometimes appears on ponds.

Vegetation Probably Present

In the alga occurs the process of photosynthesis by which the solar rays enable the chlorophyll, the green coloring matter, to build up food materials from carbon dioxide and water. The accompanying fungus supplies minerals, and also protects the alga, so that it does not dry out.

A point against the idea that there may be lichens on Mars is that observations of the green areas which come and go on that planet with the changing seasons show that the spectrum of their reflected light is different from that of lichens and moss on earth. Rather it is more like the light from our higher green plants.

It may well be, however, that the different course of evolution on another planet may be an explanation for such variation. In fact, the presence of vegetation on Mars seems more than possible, it seems probable. But higher organisms, as far as we can judge, seem most unlikely.

Celestial Time Table for May

May	EST	
1	9:00 a.m.	Moon's distance, 251,000 miles
	10:58 p.m.	Moon in first quarter
4	early a.m.	Meteors visible from constellation of Aquarius
6	8:48 p.m.	Moon passes Saturn
8	9:00 a.m.	Mars nearest, distance 51,860,000 miles
	10:28 p.m.	Moon passes Mars
9	3:16 p.m.	Full moon
13	11:00 a.m.	Moon nearest, distance 228,400 miles
16	9:39 a.m.	Moon in last quarter
23	2:28 p.m.	New moon
29	3:00 a.m.	Moon farthest, distance 251,500 miles
31	4:46 p.m.	Moon in first quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, April 26, 1952

TECHNOLOGY

Pint-Size Motor Packs Powerful Punch

➤ ELECTRIC MOTORS, only half as big as their conventional counterparts, have been developed to pack the same punch as their big sisters. That means a new-type motor weighing 10 pounds can do as much work as an old-type motor weighing 20 pounds.

Designed by the General Electric Co., Fort Wayne, Ind., the new fractional horsepower motors should make more motor-driven appliances available to the public because of savings in materials.

The new motor has a more effective ventilation system and uses aluminum generously in its structural parts. A special nylon insulating material is used which should not break down for 50 years.

Using a general-purpose drive, the motor will power such machines as oil burners, fans, blowers, compressors, pumps, farm equipment, air conditioners and commercial refrigeration systems.

Science News Letter, April 26, 1952

ENTOMOLOGY

Scientist Explains How Worm Gets Inside Ear of Corn

➤ NOW THAT corn-on-the-cob season is just around the corner, here's a question that may have stumped you in years past.

How is it that a beautiful ear of corn, with husk and silk apparently unmarred, can have inside it a thick, hungry worm, an inch and a half long, that has eaten out great chunks of the sweet kernels?

The corn earworm, a pest that is known to both home gardeners and commercial growers of sweet corn, sneaks into the ear when the silk has just emerged, explains Dr. Lauren D. Anderson, associate entomologist in the University of California Experiment Station at Riverside.

"The female moth of this well-known insect lays its eggs at dusk, usually on the freshly-emerged silks of the ear," he said. "Within a few days the eggs hatch into tiny larvae or worms, which feed down the silk channel and onto the grains of corn, where they rapidly grow to maturity and severely damage the tip of the ear in process."

At present, Dr. Anderson said, DDT leads the list of insecticides as the most effective and economical material for earworm control. Dusting or spraying of individual ears, begun as soon as silk appears and repeated three or four times at not more than three-day intervals, is the most effective treatment.

Science News Letter, April 26, 1952

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Trillium

► THE COOL, deep woods are shining about this time with the three-pointed white stars of the trillium.

Among them, but less conspicuous, glow the dark, purplish flowers of the red wake-robin, another species of the same genus. All told, the trillium tribe boasts some 30 species, most of them in North America, but part in Asia.

Wherever they live, the trilliums are all consistent exponents of the magic number three, that rules all the kin of the lilies. The broad leaves are three, the green sepals of the flower are three, the petals three. The stamens are set in two triangles of three each, and the pistil is either a triangle or hexagon when looked at from the top. So conspicuous is the plant for this constant recurrence of triple parts that one of its old and orthodox folk-names is "Trinity lily."

Though the trillium outdoes even the lily in its strict adherence to triple ar-

rangements, it departs from the habits of its clan in the structure of its leaves. In most of the plants of its division of the vegetable kingdom, the "monocotyledons" or "monocots" of the botanists, the leaf-veins are parallel, like those in grass leaves.

But in the trillium the veins are netted and irregular, resembling those of the "dicot" group, which includes practically all trees and shrubs, and many of the more conspicuous herbs, with flower parts arranged in fives rather than threes.

The trillium, however, is not alone in its departure from orthodox leaf venation; all the arums, the smilax genus, the water-plantaia family and a number of other important members of its group also have netted instead of parallel veins.

Perhaps the handsomest of the trilliums is *Trillium grandiflorum*, which is fortunately also the most abundant. Its broad-petaled open flowers form veritable galaxies through the rich, moist woods almost everywhere east of the Mississippi, and reach in more scattering fashion through the timber-strips along the streams in the prairie states.

In the South, there is another trillium, not quite so large-flowered as the *grandiflorum* species, but worthy of note in another connection. It has a decided tendency to depart from the fundamental rule of three, and very frequently will turn up with four leaves and four petals.

Science News Letter, April 25, 1952

RADIO

Moon as Message Relay

► THE MOON may some day be used daily to send messages to distant lands. It may play an important part in getting vital messages through to their destination.

Shortwave radio signals come through clearly in the midst of a radio storm when the moon is used as a reflector to bounce the waves back to the earth. The moon can be counted on when the earth's upper atmosphere no longer functions as a "radio roof" and all signals using it are blacked out.

"It is practical to use the moon as a reflector for radio telegraph service," reports G. F. Montgomery of the National Bureau of Standards' Central Radio Propagation Laboratory.

"But special, expensive equipment would be needed to put the moon to work as a reflector," Mr. Montgomery hastens to add. "A fairly powerful transmitter and relatively large antenna are both essential. Whether it will be used or not depends largely upon how important, in dollars and cents, it is to get signals through during radio blackouts.

The difficulty involved in using the moon as a reflector is that it must be above the horizon of both sending and receiving stations. Thus there is a limited period, some-

MEDICINE

Isolate California-Type Virus, Relative of Polio

► "CALIFORNIA 1 (ONE)," a type of Cocksackie virus, has been isolated by Dr. Ruth A. Boak of the Medical School at the University of California at Los Angeles.

The Cocksackie virus causes a disease sometimes confused with polio. Dr. Boak's experiments, performed at the Long Beach Veterans Hospital, mark the first time that a Cocksackie virus has been isolated in California.

"Although no previous reports have appeared in medical literature, Cocksackie viruses are undoubtedly as prevalent in California as elsewhere," said Dr. Boak.

"Virologists, however, have not diligently searched for it. Poliomyelitis is well known to be constantly present in southern California. Inasmuch as one type of illness resulting from infection with Cocksackie virus is similar to non-paralytic poliomyelitis, it may, in some cases, be erroneously diagnosed as poliomyelitis."

The U.C.L.A. scientist explained that Cocksackie virus causes many symptoms similar to non-paralytic polio but is less severe.

The newly-discovered disease was first isolated from two children living in Cocksackie, N. Y., by Dr. Gilbert Dalldorf. It has helped explain many similar illnesses where the polio virus could not be detected.

Science News Letter, April 25, 1952

NEW! NATIONAL SPRAYER

198 POSTPAID

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National Laboratories

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Science News Letter, April 26, 1952



MANEUVERABLE TANK—The M-47 mounts an embankment showing its deadly 90mm, high-velocity gun which is operated by two separate electro-hydraulic fire control systems. "Many hundreds" of these new tanks are being readied for shipment to troops.

TECHNOLOGY

New Medium Tank

► THE FIRST model of a medium-weight tank to be turned out for Army Ordnance since World War II is rolling off the assembly lines at the American Locomotive Company's plant, Schenectady, N. Y. The tank also is in production at the Army's Detroit arsenal.

Known as the M-47, the tank was ordered into production in July, 1950, even though the design had not been perfected. However, the Army knew it wanted an M-46 "Patton" tank equipped with the turret of the T-42. Army officials thought the details of that combination could be worked out while the tank was being produced.

After 10 months, the first unperfected tanks came off the assembly lines. Engineers found most of the troubles could be cured by normal automotive remedies. As cures were found, they were introduced along the assembly line and built into subsequent tanks.

The new and "bug-free" tank recently was approved by the Army's field forces for delivery to troops at home and abroad.

When ready for action, the tank weighs 48½ tons. It is 28 feet long by 11½ feet wide and 10 feet high, and will carry a five-man crew.

The Army said the M-47 is made superior by an increased probability of a first-round hit; a higher velocity gun that is more effective; a device that automatically re-aims the gun after each round is fired so that adjustments are not needed to correct for recoil effects; two separate fire-control systems, one operated by the gunner and the other by the tank commander; improved field of vision which allows targets to be spotted more easily; improved armor protection, and high maneuverability.

The tank carries a 90-mm gun, two .50 caliber machine guns, one .30 caliber machine gun, and radio transmitting and receiving equipment.

Science News Letter, April 26, 1952

BIOCHEMISTRY

Humidity Extremes Affect Vitamin Needs

► HUMIDITY AFFECTS the vitamin needs of the body, Drs. R. A. Collins, M. Schreiber, H. Nino-Herrera and C. A. Elvehjem of the University of Wisconsin reported at the meeting of the Federation of American Societies for Experimental Biology in New York.

Their findings were made on rats and the scientists do not know yet to what extent humidity extremes may affect human need for vitamins. But many facts important for human nutrition have come from such studies on rats.

When young white rats were kept in a dry air environment, their paws became dry and scaly, whether they had a complete or a vitamin-deficient diet. The rats fed all the vitamins, however, recovered from their condition, while those deprived of vitamins did not.

In very moist environments, with relative humidity at 95%, rats on the vitamin-deficient diet developed a reddish pigment which stained the fur on the head and face so that it had a blood-caked appearance. Rats fed normal amounts of vitamins were not affected this way.

Whether or not this applies directly to humans, it should help indirectly by showing that diet or vitamin studies on rats need to be made under standard conditions of humidity.

Science News Letter, April 26, 1952

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THE APHID GENUS PERIPHYLLUS: A Systematic, Biological and Ecological Study—E. O. Essig and Frieda Abernathy—*University of California Press*, 166 p., illus., \$3.00. Pioneer work in the study of this genus, so fond of our maple trees.

BIRDS OF LA PLATA—W. H. Hudson with introduction by Richard Curle and Color Plates by S. Magno—*Penguin*, 28 p., illus., 95 cents. Extracts from the author's two-volume work of the same name. The naturalist Hudson spent the early part of his life in Argentina and writes here of birds he personally knew and loved.

CYBERNETICS: Circular, Casual and Feedback Mechanisms in Biological and Social Systems—Heinz Von Foerster, Ed.—*Josiah Macy, Jr. Foundation*, 240 p., \$4.00. Transactions of a conference intended to further the exchange of ideas and experiences in this new branch of science and to pave the way for better communication between scientists of the various disciplines.

DEVELOPMENT AND TESTING OF A HYDROGEN PEROXIDE ROCKET—David Elliott and Lee Rosenthal—with THE PROPERTIES OF HIGHLY CONCENTRATED HYDROGEN PEROXIDE—Donald Haldiman—*Reaction Research Society*, 24 p., illus., paper, \$1.15. Describing a small, simple rocket using 90 per cent hydrogen peroxide with a solid catalyst. Good for the amateur.

A DICTIONARY OF PSYCHOLOGY—James Drever—*Penguin*, 316 p., paper, 85 cents. Includes not only the technical terms of psychology itself but those of bordering sciences, the meaning of which psychologists need to know. The author, emeritus professor of psychology at the University of Edinburgh, died while the book was on the press.

FIRST SYMPOSIUM ON CHEMICAL-BIOLOGICAL CORRELATION—Chemical-Biological Coordination Center—*National Academy of Sciences—National Research Council*, 415 p., \$4.00. Papers discussing the relationships between chemical structure and various biological actions and effects.

FIVE SCIENCE FICTION NOVELS—Martin Greenberg, Compiler—*Gnome*, 382 p., \$3.50. Five

different novels each by a different author and representing distinct kinds of science fiction.

FLORA OF THE BRITISH ISLES—A. R. Clapham, T. G. Tutin, and E. F. Warburg—*Cambridge University Press*, 1591 p., illus., \$9.50. This handy-sized volume contains a tremendous amount of information on the plants of England useful to botanists and students, including amateur flower-lovers.

FROST ACTION IN ROADS AND AIRFIELDS: A Review of the Literature—A. W. Johnson—*Highway Research Board*, Special Report No. 1, 287 p., illus., paper, \$3.00. An abstract type of review which gives breadth to the concept of frost action and brings out the complexity of its effects.

GIFTS FROM THE FOREST—Gertrude Wallace Wall—*Scribner's*, 96 p., illus., \$2.50. The story, told in beautiful photographs by John Calvin Towsley, of how the great giants of our forests are made into lumber for our homes and how the trees are replaced by good lumbering practice.

HEAT—R. C. Brown—*Longmans, Green*, 547 p., illus., \$2.75. The second volume of a textbook on physics intended to prepare English students for their examinations. Does not require use of the calculus.

HOME-MADE ZOO—Sylvia S. Greenberg and Edith L. Raskin—*McKay*, 256 p., illus., \$3.00. A practical handbook on the care of animals in the home—how to obtain them, feed them, house them and keep them in good health, all within a limited budget.

KRISTA AND THE FROSTY PACKAGES—Helen D. Olds—*Messner*, 60 p., illus., \$1.50. A story for young children telling what happens inside a frozen food plant.

LET THERE BE BREAD—Robert Brittain—*Simon and Schuster*, 243 p., \$3.00. The engrossing account of how the "impossible" has been and is being accomplished to make barren land produce bountiful crops to feed the world's hungry mouths.

MERELY WE ROLL ALONG—Mildred Luckhardt—*Messner*, 64 p., illus., \$1.50. This book for young children recounts some of the adventures encountered by truckers.

MOTHERS' OPINIONS OF FIBERS IN SELECTED ITEMS OF CHILDREN'S CLOTHING—Bureau of Agricultural Economics—*Govt. Printing Office*, Agriculture Information Bulletin No. 65, 196 p., paper, 40 cents. Cotton is still preferred for seven out of ten items of children's clothing; wool is liked better for snow suits.

PRINCIPLES OF GEOCHEMISTRY—Brian Mason—*Wiley*, 276 p., illus., \$5.00. A text for geology students and students of other sciences. It deals with the chemical make-up of the earth and our universe and the earth's geological history.

PUBLIC RELATIONS—Edward L. Bernays—*University of Oklahoma Press*, 374 p., \$5.00. This is not a book on tools or techniques but is intended to present the basic principles in-

olved, leaving it to the reader to work out their application to his own specific problems.

REGISTER OF NEW FRUIT AND NUT VARIETIES 1920-1950—Reid M. Brooks and H. P. Olmo with others—*University of California Press*, 206 p., \$3.00. Giving the origin, parentage, and most valuable characteristics of new varieties showing promise of becoming important commercially.

RESEARCH AND INDUSTRY: PARTNERS IN PROGRESS, ANNUAL REPORT 1951—*Stanford Research Institute*, 48 p., illus., paper, free upon request to publisher, Stanford, Calif.

SCIENCE NEWS 23—A. W. Haslett, Ed.—*Penguin*, 142 p., illus., paper, 50 cents. Presenting a new group of articles on current researches.

STEPS TOWARD PREVENTION OF CHRONIC DISEASE—*Commission on Chronic Illness*, 31 p., paper, 50 cents. Discussion of what can be done toward early detection and prevention of chronic illness.

A SURVEY OF THE SULPHUR AND SULPHURIC ACID POSITION—R. Ashton, A. L. Thorogood and D. Neville-Jones—*Her Majesty's Stationery Office*, 25 p., paper, 40 cents. In the present year world production is a million tons short of demand and in 1953 the shortage is expected to double. Here are various plans for conservation of this essential material.

THE TERPENES: Volume III, The Sesquiterpenes, Diterpenes and Their Derivatives—Sir John Simonsen and D. H. R. Barton—*Cambridge University Press*, 579 p., \$10.00. Literature has been consulted up to the close of 1949 and some references have been included for 1950. Addenda to Volumes I and II are presented.

Science News Letter, April 26, 1952

BOTANY

Scarce Minerals in Soil Affect Fruit Tree Growth

► SOIL ELEMENTS so minute in quantity that their presence can be determined only by the scientific device known as a spectrograph can have serious effect on the growth of citrus and possibly other fruit trees.

Dr. Albert P. Vanselow, chemist in the division of soils and plant nutrition at the University of California Citrus Experiment Station, Riverside, Calif., has determined that nickel in as small amount as 25 parts per million will reduce the growth of an orange seedling.

In soil containing nickel at 75 parts per million the trees grew only to 1/10th of normal size. At 150 parts the trees died.

"Nickel present in the average soil," Dr. Vanselow said, "will normally be in the form of very insoluble compounds, but if the soil is acidified to too high a degree the nickel will be made soluble and toxic to the plant."

Citrus leaves analyzed by spectrograph show a number of elements whose functions, if any, are unknown. Besides nickel there are aluminum, barium, cobalt, chromium, lead, silver, strontium and others.

Science News Letter, April 26, 1952

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BIOCHEMISTRY

Fatty Substances Increase

Amount of both fatty protein molecules and cholesterol increases in blood when weight is gained. Fatty degeneration of blood vessels produced in rats.

► WHEN a person gains weight a fatty chemical called cholesterol and certain molecules of a fatty protein increase in amount in the blood.

Both the fatty protein molecules and cholesterol in the blood have previously been implicated as causing artery damage of a kind found in a serious form of high blood pressure.

The finding that these substances increase as body weight increases was reported by Drs. Joseph T. Andersen, Adrian Lawler, Max Lowen and Ancel Keys of the University of Minnesota at Minneapolis, and the Minnesota Mental Health Research Laboratory at Hastings, Minn., at the meeting of the Federation of American Societies for Experimental Biology in New York.

The study was made with 20 middle-aged men who had the mental sickness, schizophrenia. These patients were encouraged to eat as much as they would of a well balanced high calorie diet for 20 weeks. They gained from almost two to almost 50 pounds. Three men gained more than 44 pounds during the 20 weeks.

If too much cholesterol is proved to be a cause of artery damage, a chemical method of keeping it out of the blood may have been found through researches reported at the same meeting by Drs. Gustav J. Martin and J. M. Beiler of the National Drug Company Research Laboratories in Philadelphia. Rabbits fed a high cholesterol diet did not get above normal amounts of cholesterol in their blood when given a chemical called phosphorylated hesperidin.

This chemical counteracts the effects of an enzyme chemical, hyaluronidase. Its ability to counteract this enzyme has led to its showing promise as a birth control chemical, according to earlier research by Drs. Martin and Beiler. (See SNL, April 19.)

Hyaluronidase plays a role in making substances more permeable to other chemicals. In the cholesterol studies, Drs. Martin and Beiler reasoned that it might make the walls of the intestines more permeable to cholesterol from food. So they tried the hyaluronidase - counteracting hesperidine. Their results show that the theory is apparently correct.

Fatty degeneration of the blood vessels of the heart have been produced for the first time in rats by feeding them diets modeled after those eaten by human patients who had developed the heart disease, coronary thrombosis, before the age of 45. This was reported by Dr. Robert M. Wisler of the University of Chicago.

The rats in his experiments were middle-aged and very fat, corresponding to the type of human likely to develop heart disease. In addition to various human type diets, substances conducive to producing high blood pressure were given one-third the rats. More than half of these showed degenerative changes in their heart arteries. But the heart condition developed in about one-fifth of the rats on the diets only. Chief substance in the various diets correlated with heart damage was choline.

Science News Letter, April 26, 1952

MEDICINE

Transfusions of Platelets

► VICTIMS OF future atomic bomb attacks and of some kinds of bleeding diseases may be helped by a new kind of blood transfusion, it appears from research reported to the Federation of American Societies for Experimental Biology meeting in New York.

This kind of transfusion consists in giving platelets, which are colorless, disk-shaped bodies found in the blood of all mammals.

Dogs and other animals have been saved from killing doses of X-rays by transfusions of platelets, Dr. E. P. Cronkite of the Naval Medical Research Institute and Dr. George Brecher of the National Institute of

Arthritis and Metabolic Diseases reported. The platelet transfusion helps to correct the defect in blood clotting which follows killing doses of radiation, whether from X-rays or atomic bombs. The blood clotting defect leads to fatal bleeding.

It is not necessary to correct all such clotting defects in order to prevent bleeding, these scientists pointed out.

Use of platelet transfusions in certain blood disorders that develop without radiation, and a new method of getting large numbers of functioning platelets from normal blood were announced by Drs. Allen H. Minor and Lee Burnett of Lenox Hill Hospital, New York.

These doctors have given 25 platelet transfusions to patients with thrombocytopenic purpura, aplastic anemia and acute leukemia. In nine of the 11 patients, the active bleeding was either stopped or markedly lessened for a period of one to five days after the platelet transfusion. In the other two patients, bleeding was stopped after more platelet transfusions. In six patients bleeding from the nose or gums, the bleeding could be seen to stop within a few hours after the transfusion. Four of these patients were able to undergo major surgical operations, three for removal of the spleen and one for removal of a kidney. Only one patient, a chronic asthmatic, had any reaction to the platelet transfusion.

While the platelet transfusions in these patients controlled the bleeding which is one severe symptom of the diseases, they are not cures for the underlying disease processes.

The method of obtaining active platelets developed by the Lenox Hill doctors has the advantage of being applicable to blood collected in ACD preservative solution. Blood collected in the routine way for blood banks may thus be used. The method also has the advantage of recovering about 80% of the platelets present in the blood when taken from the donor. They are concentrated by the process eight or 10 times. The volume of the platelet transfusion from four pints of blood is about six ounces.

Science News Letter, April 26, 1952

Biologists agree that the *elephant* is the longest lived mammal, excluding man.

In four years Israel has more than doubled its *population*, from 700,000 at the time of the Proclamation of Independence, May 14, 1948, to 1,600,000 today, of whom 690,000 are new immigrants from some 60 countries.

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❁ **WALKING AID**, having a rugged, rubber-tipped, four-legged base, is light enough for a 5-year-old child to carry in one hand. Standing waist high, the aid has an 18-inch handle bar at the top that persons recovering from broken limbs or paralytic diseases can lean upon.

Science News Letter, April 26, 1952

❁ **EXPANDING FILE** for cancelled checks and statements extends in an accordion-like manner to accommodate up to a normal two-year collection of those papers. Available in personal-check and business-check sizes, and in imitation or genuine leather, the file can be closed regardless of the number of checks in it.

Science News Letter, April 26, 1952

❁ **DELAYED-ACTION LIGHT** switch, which turns light on instantaneously, keeps light turned on about one minute after switch is flipped off. Easily installed in existing wall outlets, it is useful for porches, bedrooms and other places where light is needed for a few moments after the switch has been thrown.

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❁ **MAGNETIC TAPE RECORDER**, designed to be used with high-frequency telemetering equipment, has a frequency-recording range from 100 to 100,000 cycles per second. Capable of recording on four different tracks, the machine is powered by an improved, constant-speed drive system.

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❁ **IDENTIFICATION TAGS**, made of an orange plastic and shown in the photo-

Do You Know?

The Indian buffalo has grown a single horn measuring about six feet, five and one-half inches, the longest known horn.

Fog during the daytime produces the worst conditions under which airplane pilots must try to see landing-field approach lights.

Viruses are infectious agents largely characterized by their small size and ability to reproduce only within living cells.

Insects compose the largest class of animals, and the Staphylinidae, or rove beetles, one of the largest single families of living things in the animal world.



graph, can be labeled with wax pencils or crayons and easily wiped clean for re-use. Permanent information can be hot-stamped on by the manufacturer or applied with ink by the user. A slender three-inch stem bends

around the item being marked and fits into a hole in the tag, holding it securely.

Science News Letter, April 26, 1952

❁ **AUTOMATIC-ZERO BURETTE** for laboratories screws into a plastic reservoir which can be squeezed to fill the burette through a polyethylene delivery tube. Currently available in 10 and 25 ml sizes, the device gives protection against breakage.

Science News Letter, April 26, 1952

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Science News Letter, April 26, 1952

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